DOCUMENT-IDENTIFIER: US 3033655 A
TITLE: Tube for detecting impurities in air

Title (1):
Tube for detecting impurities in air

OCR Scanned Text (3):
3 the individual chamber sections, these can be made of different colors. The construction@ accord-ing to the invention assures a- satisfactory intimate contact between the air flowing through and the reagents. As has been said, the air resistance in the construction described is very low in the individual chambers. It is possible, however, if desired, to adjust the amount of air flowing through the different chambers according to the- cross-section of the chambers. This can, be done by changing the an.-les at which the longitudinal walls form with each other, so that the cross-section of the chairbers and thus their volume is changed. In the form of the invention shown in FIGS. 3 and 4, the tube 8 is formed of glass, and is constructed at its ends in the same manner as in FIG. 1. At one point along its length, it is surrounded by a sleeve 9 of flexible plastic material@ At this poiiit, the tlbe is provided with a nick 10 to facilitate breakage. Inside the tube 8 is a separator 12, in the form of a cross, dividing the inter,'@or into a series of four chambers, in which are arranged four ampoules, Ilai Ilb, Ilc and Ild. As one example, the tube Ila may be used for testing for cyanogen chloride. The ampoule i@ filled with a solution of 4-benzyl@yridine and barbituric acid dissolved in acetone. This has no cover. Tube lib is used for testing for phosgene. It contains a solution of li-phenylbenzylamine in alcohol. It has a cotton cloth jacke+l impregnated with sodium carbonate solution and dried. TubellcisfortestingforLewisite. The ampoulecontain-s a solution of Michler's thioketone in alcohol. There is no cloth cover. Tube Ild is used for testing for N-Lost (mustard gas). It contains a solution of Dragendorf's reagent (potassium bismuth iodide in ethyl acetate or ether). The otiter covering of the ampoule is a filter paper impregnated vntli silica gel. Another possible arrangement is shown in FIG. 5, in which a T-shaped insert is used which divides the interior into two chambers of equal volume an-d a third chamber of double the volume of either of the first two chambers. it is also possible through varying the dimension of the inlets into the chambers to change the resistance to the air flow and thereby the throughput of air, ;a,osa,655 4 For exam le if, in the form of FIG. 5 it is desired to use p one of the reagents in twice the quantity of each of the other two, this can be placed in the largest chamber and the entrance to the chamber,,can, be so dirdensioned that the flow of air through all three chambers is practical'iy equal. VVhile I have described herein some embodirnents of my invention, I wish it to be understood that I do not int,,nd to limit myself thereby except within the scope of the lo claims hereto or hereinafter appended. I claim: 1. A device for testing gases comprisir@g an elongated transparent tubular member, separatin- means within the member comprising at least one wall extending longitudi- 15 nally within the tubular member -and dividitig it into cortipartnents, glass ampoules containina tesling reagents within said compartments, at least one of said glass ampoules having an outer covering of liquid-absorbent material, said tubular member having a portion deformable 20 to permit breaking of the arnpoules from the outside of the tube. 2. A device as claimed in claim I in which said separating means cornprises an insert. 3. A device as claimed in claim 2 in which the ttibular 25 member and insert are of flexible material. 4. A device as claimed.ire claim 1 in which the tubular member is of flexible material. 5. A device as claimed in claim 1 in which the tubular member is of glass and the defgrmable portion is a break- 30 able portion, and a sleeve of transparent flexible material around the breakable portion. 6. A device as claimed in claim I in which the liquidabsorbent material comprises a sleeve on the outside of the ampoule. 35 7 ' A device as claimed -in claim 6 in which the sleeve is formed of cotton cloth. 8. A device as claimed in claim 1 in which the, liquidabsorbent material is paper. 40 R-.ferences Cited iii the file of th-@s patent UNITED STATES PATENTS 1,333,850 Kennedy ---------- Mar. 16, 1920 2,908,555 Grosskopf ---------- Oct. 13, 1959 45

L3: Entry 3 of 4 File: PGPB Oct 30, 2003

PGPUB-DOCUMENT-NUMBER: 20030203495
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030203495 A1

TITLE: Diagnostic test for elemental imbalances

PUBLICATION-DATE: October 30, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Rupp, Michael E.	Redondo Beach	CA	US

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DATE FILED: April 24, 2003

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Application is a non-provisional-of-provisional application 60/375566, filed April 25, 2002,

INT-CL-PUBLISHED: [07] G01N 31/22, G01N 33/20

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPS	G01 N 31/22	20060101
CIPS	G01 N 33/84	20060101

US-CL-PUBLISHED: 436/74; 422/56
US-CL-CURRENT: 436/74; 422/56

REPRESENTATIVE-FIGURES: 2

ABSTRACT:

A self-diagnostic test, a self-diagnostic test apparatus, and method of manufacturing a self-diagnostic test for screening for elemental mineral imbalances in a patient utilizing an analysis of the reaction of mineral specific reagents to a sample from a patient are provided. In one embodiment, the invention is directed to a test for those elements that occur naturally in the body. In such an embodiment, the invention may test for those elements that comprise about 0.001% of the body weight or less (microtrace), those elements that comprise about 4% of the body weight or less (trace), those elements that comprise up to 96% of the body weight (mass), or any combination of the above.

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is based on U.S. Application No. 60/375,566, filed on Apr.

25, 2002, the disclosure of which is incorporated by reference.

Previous Doc Next Doc Go to Doc#

L3: Entry 3 of 4 File: PGPB Oct 30, 2003

DOCUMENT-IDENTIFIER: US 20030203495 A1
TITLE: Diagnostic test for elemental imbalances

Abstract Paragraph:
A self-diagnostic test, a self-diagnostic test apparatus, and method of manufacturing a self-diagnostic test for screening for elemental mineral imbalances in a patient utilizing an analysis of the reaction of mineral specific reagents to a sample from a patient are provided. In one embodiment, the invention is directed to a test for those elements that occur naturally in the body. In such an embodiment, the invention may test for those elements that comprise about 0.001% of the body weight or less (microtrace), those elements that comprise about 4% of the body weight or less (trace), those elements that comprise up to 96% of the body weight (mass), or any combination of the above.

Detail Description Paragraph:
[0024] This present invention is directed to a self-diagnostic test kit for screening for elemental mineral imbalances in a patient, referred to as the diagnostic test herein.

Detail Description Paragraph:
[0048] In step 5, once the reagents are deposited and cured the web is finished and packaged for sale. Such a step may include many sub-steps including: cutting the web to a suitable size and shape; attaching the web to suitable product packaging; printing any instructional or consumer warning messages onto the packaging; and boxing or wrapping the test for final shipment. For example, the finishing process in one exemplary embodiment includes: applying a bead of adhesive to the back side of the web at prescribed locations; perforated rotary die cutting the web to a specified size and shape; attaching the perforated portion of the web to a sample container; and printing instructions and scale information on the web or box and boxing the test for shipment.

Detail Description Paragraph:
[0052] Finally, it should be understood that although this test is designed to provide a method of allowing self-diagnosis of an elemental imbalance by a user, the diagnostic test is not designed to provide quantitative information about the imbalance. It would be expected, and should be provided in the instructions of the test, that a user finding a positive indication of an elemental imbalance immediately contact a physician for a detailed quantitative analysis of the particular elemental imbalance found by the screening test of the current invention. Accordingly, it should be understood that while the test is designed for home use, it could also be utilized in a hospital setting as a screening test in combination with a more quantitative test available from a hospital laboratory. In one exemplary embodiment, the packaging of the home diagnostic test may include a list of the quantitative test codes or diagnostic codes suggested by the federal government, or a particular hospital or insurance provider given a particular diagnosis indication by the diagnostic test of the present invention.

CLAIMS:

9. The self-diagnostic test as described in claim 5 wherein the mineral specific

reagents are selected from the group consisting of azomethine-H; chromotropic acid; dinitronaphthalenediol; 3,5-di-t-butylcatechol; 2,6-dihydroxybenzoic acid; curcumin; 5-Br-PAPS; o-nitrophenylfluorone; diphenylcarbazide; 5-Br-PADAP; BTAMB; TAMSMB; 5-Cl-PADAB; dithizone; 3,5-diBr-PAMB; nitroso-DMAP; nitroso-PSAP; nitroso-DEAP; 5-Br-PADAB; bathocuproin disulfonic acid disodium salt; bathocuproin; 3,5-diBr-PAESA; sodium bicinchoninate; neocuproin; 5-Br-PSAA; TMPyP; Na-DDTC; alfusone; chromazurol S; phenylfluorone; K.sub.2HgI.sub.4/I.sub.2; bindschedler's green leuco base; diphenylcarbazone: tris(1,10-phenanthroline)Fe(II) complex; bathophenanthroline disulfonic acid disodium salt; TPTZ; PDTS; PDT; nitro-PAPS; PPKO; ferrene S; PAR; oxine; DDTC; toluene-3,4-dithiol; PAN; dimethylglyoxime; bismuthiol-2; 2,3-diaminonaphthalene; PV; SATP; toluene-3,4-dithiol; henylfluorone 3,3-diaminobenzidine; o-phenylenediamine; 4-chloro-o-phenylenediamine; ammonium molybdate; malachite green; BPA; zincon; XO; TMPyP; zinquin ethyl ester; and T(5-St)P.

10. The self-diagnostic test as described in claim 6 wherein the mineral specific reagents are selected from the group consisting of PC; MX; indo 1; indo 1-AM; chlorophosphonazo-III; neo-thorin; fluo 3; fluo 3-AM; arsenazo-III; HDOPP-Ca; rhod 2; rhod 2-AM; GHA; quin 2; quin 2-AM; calmagite; fura 2; fura 2-AM; thio-michler's ketone; MQAE; SPQ; diethylcarbamate-Cu; diphenylcarbazone; triocytlin; tris(1,10-phenanthroline)Fe(II); Co(3)-5-Cl-PADAP; malachite green; bis(12-crown-4); nitrophenylazo-15-crown-5; oxine; pararosaniline; barium chloranilate; methylene blue; O-phthalaldehyde; p-phenylenediamine; tris[2-(phenyliminomethyl)pyridinato] iron; and 2-aminoperimidine HCl/HBr.

11. The self-diagnostic test as described in claim 7 wherein the mineral specific reagents are selected from the group consisting of lumogallion; o,o'-dihydroxyazobenzene; aluminon; oxine; 5-Br-PADAP; rhodamine B; brilliant green; arsemate; thionalide; nitrocatechol; ethyl violet; dimethylsulfonazo-III; sulfonazo-III; chlorophosphonazo-III; chromazural S; arsenazo-I; acetylacetone; beryllon-III; 2-methyloxine; bismuthio-II; XO; DDTC; dithizone; bindschedler's green leuco base; diphenylcarbazone; PAN; formaldoxime; pyrogallol red-AM; cesibor tetraphenylborate; EuAc.sub.3 Eu.sub.2O.sub.3; GdAc.sub.3; Gd(NO.sub.3).sub.2; sincon; semiethylxylenol Blue; KAu(CN).sub.2; NaAuCl.sub.4; KAuCl.sub.4; KAuI.sub.4; 5-(p-dimethylaminobenzylidene)rhodamine; PAR; K.sub.3IrCl.sub.6; Na.sub.3IrCl.sub.6; SnCl.sub.2-HBr; leuco-crystal violet; PbAc.sub.2; PbCl.sub.2; Pb(NO.sub.3).sub.2; MePbAc; TPPS; thorin; bibenzyl-14-crown-4; phosphododecyl-14-crown4; TTD-14-crown-4; methyldodecyl-12-crown-4; dibenzothiazolylmethane;EtHgCl.sub.2; EtHgphosphate; Hg(CN).sub.2; EtHgthiosalicylate (thiomersal); mersalyl; PCMB; PHMB; PCMBS; PhHgAc; HgCl.sub.2; HgAc.sub.2;HgSO.sub.4; mercurochrome; Baker's reagent (2Hg); tetrakismercuryacetate (TAM)(4Hg); STTA; thio-Michler's ketone; di-alpha-napthaylthiocarbonate; sulfochlorophenol-S; TPAC; BPR; phenylfluorone; Os(NH.sub.3).sub.6I.sub.3- ; K.sub.2OsCl.sub.6; K.sub.2OsO.sub.4; tiron; K.sub.2PdCl.sub.4; K.sub.2PdBr.sub.4; K.sub.2PdI.sub.4; PdCl.sub.2; Pd(NO.sub.3).sub.2; BTAMB; 5-Br-PSAA; 5-Br-PAPS; thiooxine; p-nitroso-N,N'dimethylaniline; K.sub.2PtCl.sub.4; K.sub.2PtCl.sub.6; K2PtI.sub.6; K.sub.2Pt(NO.sub.2).sub.4; Pt(NH.sub.3).sub.2Cl.sub.2; Pt (ethylenediamine)Cl.sub.2; K.sub.2Pt(CN).sub.4; ReCl.sub.3; 2-furildioxime; dimethylglyoxime; methylene blue; kalibor; TPTZ; 1,10-phenanthroline; SmAc.sub.3; Sm(NO.sub.3).sub.3; SmCl.sub.4; 5,7-dichloro-oxine; quinizarin; AgNO.sub.3; KAgCN.sub.2; 3,5-diBr-PADAP; 3,5-diBr-PAESA; 2-amino-6-methylthio-4-pyrimidine-carboxylic acid; PC; dinitrosulfonazo-III; murexide; bismuthiol-2; diethydithiocarbamate; malachite green; Th(NO.sub.3).sub.4; arsenazo-III; morin; diantipyrylmethane; 0,0'-dihydroxyazobenzene; crystal violet; alizarin; Na.sub.2WO4; toluene-3,4-dithiol; UO.sub.2Ac.sub.2; K.sub.3UO.sub.2F.sub.5; UO.sub.2(NO.sub.3).sub.2; UO.sub.2SO.sub.4; TbCl.sub.3; YbAc.sub.3; Zr (NO.sub.3).sub.4; PV; TAN; and alizarin red S.

14. A self-diagnostic test apparatus comprising: a body having at least one biological fluid receptacle disposed thereon; a biological sample conduit in fluid

communication with the at least one biological fluid receptacle; and a plurality of mineral specific reagents disposed such that each mineral specific reagent may be exposed to a biological sample deposited within the at least one biological fluid receptacle, the mineral specific reagents being selected to react with a different selected mineral within the biological sample such that when the selected mineral specific reagent is exposed to a sufficient concentration of the selected mineral in the biological sample a visible change is induced in the selected mineral specific reagent.

15. The self-diagnostic test apparatus as described in claim 14 comprising a plurality of biological fluid receptacles wherein each of the plurality of mineral specific reagents is independently disposed within a different one of the plurality of biological fluid receptacles.

16. The self-diagnostic test apparatus as described in claim 14 wherein each of the plurality of mineral specific reagents is disposed on a different at least one substrate removably disposed within the at least one biological fluid receptacle.

17. The self-diagnostic test apparatus as described in claim 16 wherein each of the different at least one substrates is a dipstick.

18. The self-diagnostic test apparatus as described in claim 14 wherein at least a portion of the body is transparent such that the visible change of the selected mineral specific reagents may be externally viewed.

19. The self-diagnostic test apparatus as described in claim 14 wherein the plurality of mineral specific reagents are selected to detect at least one mineral from a mineral family selected from the group consisting of microtrace, trace, mass, and all naturally occurring.

20. The self-diagnostic test apparatus as described in claim 14 wherein the plurality of mineral specific reagents are selected to detect at least one mineral that does not occur naturally within the human body.

21. The self-diagnostic test apparatus as described in claim 14 wherein the plurality of mineral specific reagents are selected to detect a mineral imbalance indicative of a disorder selected from the group consisting of ADD/ADHD, Alzheimer's disease, anemia, ataxia, bipolar disorder, birth defects, blood disorders, brain damage, brain disease, breast cancer, breathing disorders, bone cancer, cardiomyopathy, general cancer, Crohn's disease, depressive disorders, encephalopathy, eye damage, heart damage, high blood pressure, infertility, intestinal disorders, leishmaniasis, liver cancer, liver damage, lung damage, lung disease, lung cancer, kidney damage, kidney disease, manic disorders, nerve damage, neuropathy, organ damage, pancreatic cancer, periodontal disease, psychosis, renal failure, skin disorders, and Wilson's disease.

22. The self-diagnostic test apparatus as described in claim 14 wherein the plurality of mineral specific reagents are selected to detect an imbalance in a plurality of minerals selected from the group consisting of B, Ge, F, I, Si, V, Cr, Co, Cu, Fe, Ni, Mo, Se, Zn, Sn, and Mn.

23. The self-diagnostic test apparatus as described in claim 14 wherein the biological sample is selected from the group consisting blood, urine, saliva, mucous, tears, and hair.

24. The self-diagnostic test apparatus as described in claim 14 wherein the visual change is a calorimetric change.

DOCUMENT-IDENTIFIER: US 5174959 A
**** See image for Certificate of Correction ****
TITLE: Breath component monitoring device

Brief Summary Text (10):
Fortune, U.S. Pat. No. 2,186,902 discloses the use of soluble nitroprusside chromogens in the presence of ammonia and soluble carbonates for the detection of what was termed "acetone" (actually acetoacetic acid) in urine samples. Varying colorations are observable for the quantitative determination of "acetone" levels.

DOCUMENT-IDENTIFIER: US 20030021744 A1
TITLE: Process for removing hydrogen sulfide from gas streams which include or are supplemented with sulfur dioxide, by scrubbing with a nonaqueous sorbent

Summary of Invention Paragraph:
[0004] The present inventor's U.S. Pat. No. 5,738,834, the entire disclosure of which is hereby incorporated by reference, discloses a process which uses a sulfur-amine nonaqueous sorbent (SANS) and operating conditions under which sulfur itself can convert hydrogen sulfide to polysulfides which are nonvolatile but which can be readily transformed to sulfur by reaction with an oxidizing agent. This is done in a solvent with a high solubility for sulfur so that solid sulfur formation does not occur in the absorber or in the air-sparged regenerator. Solid sulfur formation can be initiated in process equipment designed to handle solids and can be done under well-controlled conditions. In the SANS process, the sour gas is fed to an absorber (typically countercurrent) where the H.sub.2S is removed from the gas by a nonaqueous liquid sorbing liquor which comprises an organic solvent for elemental sulfur, dissolved elemental sulfur, an organic base which drives the reaction converting H.sub.2S sorbed by the liquor to a nonvolatile polysulfide which is soluble in the sorbing liquor, and an organic solubilizing agent which prevents the formation of polysulfide oil--which can tend to separate into a separate viscous liquid layer if allowed to form. The solubilizing agent is typically selected from the group consisting of aromatic alcohols and ethers including alkylarylpolyether alcohol, benzyl alcohol, phenethyl alcohol, 1-phenoxy-2-propanol, 2-phenoxyethanol, alkyl ethers including tri(propylene glycol) butyl ether, tri(propylene glycol) methyl ether, di(ethylene glycol) methyl ether, tri(ethylene glycol) dimethyl ether, benzhydrol, glycols such as tri(ethylene) glycol, and other polar organic compounds including sulfolane, propylene carbonate, and tributyl phosphate, and mixtures thereof. The sorbing liquor is preferably essentially water insoluble as this offers advantages where water may be condensed in the process. It is also preferable for water to be essentially insoluble in the solvent. The nonaqueous solvent is typically selected from the group consisting of alkyl-substituted naphthalenes, diaryl alkanes including phenylxylyl ethanes such as phenyl-o-xylylethane, phenyl tolyl ethanes, phenyl naphthyl ethanes, phenyl aryl alkanes, dibenzyl ether, diphenyl ether, partially hydrogenated terphenyls, partially hydrogenated diphenyl ethanes, partially hydrogenated naphthalenes, and mixtures thereof. In order to obtain a measurable conversion of sulfur and hydrogen sulfide to polysulfides, the base added to the solvent must be sufficiently strong and have sufficient concentration to drive the reaction of sulfur and hydrogen sulfide to form polysulfides. Most tertiary amines are suitable bases for this use. More particularly, tertiary amines including N,N imethyloctylamine, N,N dimethyldecylamine, N,N dimethyldodecylamine, N,N dimethyltetradecylamine, N,N dimethylhexadecylamine, N-methyldicyclohexylamine, tri-n-butylamine, tetrabutylhexamethylenediami- ne, N-ethylpiperidine hexyl ether, 1-piperidineethanol, N-methyldiethanolamine, 2-(dibutylamino)ethanol, and mixtures thereof are suitable for use in the said process. It should be noted that while the solvent utilized in the process requires the addition of a base to promote the reaction of sulfur and hydrogen sulfide to form polysulfides, the base and the solvent may be the same compound.

US 20030021744A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2003/0021744 A1

DeBerry et al. (43) Pub. Date: Jan. 30, 2003

(54) PROCESS FOR REMOVING HYDROGEN SULFIDE FROM GAS STREAMS WHICH INCLUDE OR ARE SUPPLEMENTED WITH SULFUR DIOXIDE, BY SCRUBBING WITH A NONAQUEOUS SORBENT

(76) Inventors: **David W. DeBerry**, Austin, TX (US); **Dennis Dalrymple**, Georgetown, TX (US); **Kevin S. Fisher**, Georgetown, TX (US)

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(21) Appl. No.: **10/190,448**

(22) Filed: **Jul. 5, 2002**

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/503,898, filed on Feb. 15, 2000, now Pat. No. 6,416,729.

(60) Provisional application No. 60/156,545, filed on Sep. 29, 1999.

Publication Classification

(51) Int. Cl.[7] B01D 53/52

(52) U.S. Cl. 423/228; 423/576.4

(57) **ABSTRACT**

The invention relates to improvements in a known process and system wherein hydrogen sulfide is removed from a gaseous stream, using a nonaqueous scrubbing liquor in which are dissolved sulfur and a reaction-promoting amine base. In a first aspect of the invention sulfur dioxide is added to the sulfur-amine nonaqueous sorbent (or advantage is taken of SO_2 which may already be present in the gas stream) to obtain better H_2S removal, lower chemical degradation rates, and lower rates of formation of byproduct sulfur salts. In a further aspect of the invention the gas to be treated is mixed with oxygen and passed through an oxidation catalyst reactor to either effect oxidation of part of the H_2S to form the required amount SO_2 for reaction with the remaining H_2S, or to effect partial oxidation of the H_2S in the feed gas to form elemental sulfur, or to form various combinations of products as desired for the application, prior to scrubbing with the nonaqueous solvent.

DOCUMENT-IDENTIFIER: US 6544492 B1
TITLE: Regeneration method for process which removes hydrogen sulfide from gas streams

Detailed Description Text (3):
Absorber 11 is a conventional liquid-gas contact apparatus at which the input gas stream 22 to be purified is passed in counter-current or other relation to a liquid sorbent liquor 26. Absorber 11 may for example take the form of a tower which is packed with porous bodies so as to provide a high surface area for the gas-liquid contact. Other absorber apparatus as are known in the art can similarly be utilized. Pursuant to the invention, the sorbent liquor 26 comprises a preferably nonaqueous solvent having a high solubility for sulfur, typically in the range of from about 0.05 to 2.5 g-moles of sulfur per liter of solution. Sorbent liquor 26 as provided to absorber 11 includes sulfur dissolved in the nonaqueous solvent in the range of from about 0.05 to 2.5 g-moles of sulfur per liter of solution, together with a base (such as the aforementioned tertiary amines) having sufficient strength and sufficient concentration in respect to that of the hydrogen sulfide and sulfur to drive a reaction between the sulfur and hydrogen sulfide which results in formation of one or more nonvolatile polysulfides which are soluble in the solvent. In order to provide sufficient residence time for the reactions forming the polysulfidc, a reactor vessel 15 is preferably provided downstream of the absorber. This vessel can also be physically present in a delay section at the base of the absorber tower. The reactor vessel can be of conventional construction such as a plug flow reactor. Total residence time for the reaction, whether carried out in the absorber alone, in the absorber and the reactor, or in the reactor alone, can be in the range of 5 to 30 minutes, with 15 minutes or so being typical. The polysulfide remains in solution in the solvent, and the spent sorbing liquor including the dissolved polysulfide is conveyed via line 13 to a regenerator 10. Since it is possible for certain polysulfide intermediates to separate as their concentration increases during practice of the invention (e.g., an amine-polysulfide "red oil" where the aforementioned base is a tertiary amine), a polysulfide solubilizing agent is preferably also present in sorbing liquor 26. Benzyl alcohol is a typical such solubilizing agent; however other agents such as benzhydrol, glycol, and mixtures of these several agents are suitable; and in addition the solubilizing function can be accomplished in some instances by one of the other components of the sorbent, such as the nonaqueous solvent or the base.

DOCUMENT-IDENTIFIER: US 6627377 B1
** See image for Certificate of Correction **
TITLE: Positive photosensitive poliymide composition

Brief Summary Text (31):
As the preferred photosensitive aromatic diamines, firstly, dialkyl-diamino-bisphenyl sulfone and dialkoxy-diamino-biphenyl sulfone such as 3,3'-dimethyl-4,4'-diamino-biphenylsulfone and 3,3'-dimethoxy-4,4'-diamino-biphenylsulfone are exemplified. The polyimides containing such biphenyl sulfones are linear polymers having high mechanical strengths and high moduli of elasticity, so that they are studied as highly elastic polyimide fibers, and also as gas separation membranes because they can be made into films. They can be used as fibers or films, and also as photosensitive films. As shown in the Examples below, these polyimides containing biphenyl sulfone do not show photosensitivity even if Michler's ketone which is a sensitizer or a radical generator is added. It was discovered, however, that they are soluble in alkalis by irradiation with light after adding a quinone diazide compound. Even if the molecular weight (based on polystyrene) is changed to 30,000, 50,000 and 100,000, the polyimides are soluble in alkalis. From this fact, it is thought that the quinone diazide is photodecomposed to generate a radical and simultaneously to be converted to indene acid, and the product interacts with the polyimide groups and biphenyl sulfone groups, so that the polyimide is converted to be alkali-soluble. That is, by UV irradiation, the quinone diazide compound is photodecomposed and indene acid is further generated. As a result, the alkyl group or alkoxy group on the biphenyl group is activated so that the sulfone bond is cleaved, and indene acid is added thereto, thereby increasing the solubility of the polyimide in alkalis.

Brief Summary Text (32):
Additional preferred examples of the photosensitive aromatic diamines include 9,9-bis(aminophenyl) fluorene and 9,9-bis(aminoalkyl-phenyl)fluorene. The polyimides containing such fluorenes are linear polymers having high mechanical strengths and high moduli of elasticity, so that they are polyimides having excellent film properties, and having excellent properties when formed into gas separation membranes. They can be used as fibers or films, and also as photosensitive films. As shown in Examples below, these polyimides do not show photosensitivity even if Michler's ketone which is a sensitizer or a radical generator is added. It was discovered, however, they are converted to be soluble in alkalis by irradiation with light after adding a quinone diazide compound. Even if the molecular weight (based on polystyrene) is changed to 30,000, 50,000 and 100,000, they interact with the radical and the acid produced by photolysis of the quinone diazide to form alkali-soluble polyimides, which give clear positive-type images. More particularly, 9,9-bis(aminophenyl)fluorene is synthesized from fluorenone and aniline in the presence of an acid catalyst (Beilstein 13,III,548a). Fluorenone is a photosensitizer which is used as widely as Michler's ketone and benzanthrone. Although fluorenone-containing polyimides are sensitized by irradiation with light, they are usually not photodecomposed. It was discovered, however, if a quinone diazide co-exists, the quinone diazide generates a radical by irradiation with light, and radical becomes indene acid that interacts with the polyimide, so that the bis (aminophenyl)fluorene-containing polyimides are soluble in alkalis. This is presumably because that the SP3 carbon structure at the 9-position of the bis(aminophenyl)fluorene group in the polyimide chain is temporarily stabilized by resonance and is changed to SP2 carbon structure, so that the aniline group is eliminated and the polyimide chain is cleaved. Various fluorenone derivatives are known. For example, there are 2-nitro compounds, 2,7-dinitro compounds and 7-chloro compounds. Similarly, as for aniline, various derivatives such as 2-methylaniline and 2-methoxyaniline are known. From the above-described fluorenone derivatives and the aniline derivatives, various 9,9-bis(aminophenyl)fluorene derivatives are produced in the presence of an acid catalyst. These derivatives also constitute positive-type photosensitive compositions. By using benzathrone compounds in place of the fluorenone, positive-type photosensitive polyimide compositions are also obtained.

First Hit

L13: Entry 199 of 261 File: USOC Jul 6, 1965

DOCUMENT-IDENTIFIER: US 3193404 A
TITLE: Associated dye salts and method of forming colored indicia therewith

OCR Scanned Text (3):
3,198,404 at 160-290' C., resembling sodium azide in this respect. No explosion has ever been obtained under normal worlc- ing conditions with this compound, which is very soluble in toluene. . The only know member of this type, that from 5 Michler's hydr©l and benzenesulfinic acid (called phenyl- (4,4'-bis(dimethylamino)-benzhydryl)-sulfone) is coiii- pletely insoluble at roo.,ii temperature in @@the usual sbl- vents used in recording @systems. It has been found by the author of the present invention, however, that the 10 use of aliphatic sulfinic acids and the use of substituted aromatic sulfinic acids, where the substituent is one bf a series of oil-solubility promoting (lipophilic) grbups such as @alkyl, halogen, ether, etc., gives s6lvent-sol-able sulfinates which are stable, substantially colorless, and 15 non-staining to skin, p,aper, and textile fibers. From -the viewpoint of classic theory, these salts are for the most part th6 salts 6f weak bases and moderately strong acids. It is axiomatie in chemistry that the salts of strong bases-strong acids (sodium chloride, Crystal, 20 Violet Chloride, etc.) are always one hundred percent dissociated; but the salts of weak acids-strong bases@, and' of weak bases-strong acids r@iay be more or less associ- ,ated depending upon environmental conditions. @ It would appear that one method of adapting other dye bases for -25-use iii thO present inventioii would be to lower tlleir ba.@e strength by suitable substitution. This is a hieved in quanticule-donating systems by incorporating quanticule- ,attracting groups (nitro, trifluoromethyl, etc.) info the aryl grou P. It was found that Cry.Rtal Violet dye, for example, could be nitrated to give 2,2' - dinitro-4, 4,4"-tris(dimethyl- amino)-triphenylcarbinol, a weak base. This weak base can form undissociated dye salts with suitable anions as well as dissbeiated dye salts with other anions. Similarlv, 35 2 - nitro - 4"4"-:bis(dimethylan-iino-triphenylearbinol is easily prep@ared for use in @the present invention as,are other nitrated triar371methape dye derivatives. While these nitrated dye bases containing only one nitro group are not always cbmpletely nonstaining, their associ- ated 40 salts are nonstaining and one can use associatect salts for purposes where the free icolor bases -,Lre Li,-isatisfaictory. Although the associated salts of n,.trated tri@xylmethane dye bases are not completely colorless, being @a light orange in 6olor, transfer sheets containing these salts @5 ..are the same light yellow color as standard yellow coni- r.icreial papers and may be substituted into any form where a pale-colored base web is not objectionable., The nonstaining nature of solutions of these salts relider,s their use far more attractive than the -violet- colored, 50 strongly-staining solutions of Methyl Violet Oleate. The use of !other meta-directing .-roups 'vban rhe nitro group to reduce the base strength of triarylnethane dyes, such as triffuoromethyl and N,N-dialkylsulfonairido, will also furnish intermediates for the dye salts of the present 55 invention. In these cases, the parent carbinol bases are substantially colorlessl.as are the resultant salts. The @sal-ts of the present invention are all water--insol- uble. I Inasmu.ch as water is ionizing in nature, colorless -solutions lof these associated salts in -a:Ge@tone, alcbhol, etc. 60 becoir.e colored upon addition @of wa'v---r; for this Teason the Associated salts of the preser@t in-ver@'Lion should b@- i.,sed @only in systems which d,o not have,an a-,3preciablle water- contbnt. Water-soluble salts of triarylmeth,,ine color bas@@s are discussed in my copendin,@ application, Stab-le 65 Triarylmethanesulfonic Acid Derivatives and Method o'L Forming Colored Indicia

Therewith, Serial No. 200,056, filed June 5, 1962. The author has found that certain unfired silicates such as diatomaceous earth, kaolin, and bentonite posse.@s high 70 ionizing @properties apart from their acid-bise and oxidation-reduction properties. A clay molecule may Pictured as a large molectile of polymeri2ed silica containing calcium, iron, and other cations. The ir6n silic@te structure -.ives oxidizing prop.-rties to the ;clay and 75 4 the @calciiim silicate gives acidic tand ion-exchange properties to the clay-, but it is the polymerized silica structure which gives a high electric dipole moment over the surface of the clay; - This electric dipole is stable until the clay is calcined @at high temperature, at which point the electric d@pole moment disappears; and the aforementioned clays lose their ionizing properties. Although other workers in the recording field, notably Bjorksten,@ Green, and Bour, have utilized certain silicates ii -recordijig p-apers, no worker has yet utilized the clays as otli@sr than chemical reagents. It is the purpo,-Ze of this application to describe a practical utilization bf the ionizing properties of silicates possessed of a high dipole mom- ,nt. The compounds of the present invention offer certain ;advantages over the color bases from which they are derive,-i: (1) As the inethod of color formation by dissociation is different from the method of color formation @by reaction of a dye base with an acid, there is oftentimes). marked increase in the rate of react@ion. Dinitro Crystal Violet Base, for example, when pure forms a colored -salt with -acid silicates only very slowly (3-5 minutes or lono.er); but the dissociation of Dinitro Crystal Violet Az de to the colored ion under t in Ince o e silicatee electric dii)ole -moment is immediate, and iiitense colored print appears immediately up6n recording wit this azide. (2) The stability certain color baqes, such as. mononitro Crystal Violet Base, which have logarithmic dissociation constants between 5 and 7, is improved, and this is of value in manifolding - R'neets which must be stored indefinitely before use. (3) The associated salts fbrmed can be more safely handled v@,ithout chemical s.taining than can the more reactive color @bas6s because of lower water-solubility (i.e., thev are less-solii'ole in the skin perspiration). Wbile the compounds bf @ the present.innention cannot be used in aqueous soluitons and,are more reactive than th-- water-soluble triar ylmethan.-sulfonates, which are disclosed in my copending application, they do, however, have applications in recording systems where a nonvolatile color-former is desired which will record colored on selected areas from a lipophilic solvent. Description Alichler's hydrol (4,4' - bis-(dimethylamino)-benzhydrol), ethyl hydrol (4,4'-bis- (diethylamin6)benzhydrol), Dinitro Crystal Violet Carbinol and other compou-@los of this type are dissolved in glacial acetic -acid to form the intensely colored acet@Lte. To this colored dye solution is added the desired@sulfinic acid either as the free sulfinic acid or as its sodium salt (the sodium salt form i preferred because the sulfinic acid salts have greater storage stability than the fre6 sulfinic -acids which tend to polymerize upon standing. in the air) until the intense color i-s discharg-.d or until the sollution becomes a inarkedly lighter color. The sulfinate may deposit at this time or may -be retained in solution. Tle solution is tlicn poured into cold I water or cold ammonium hydroxide solution to@ -orecivitate 4out the, water-insolubl-. sulfinate. The precipitate is collected, washed with water, dried, and recrystallized from alcohol to give the colorless sulfinate. The reactio@i way be carried out in dilute aqueous acids or in acidic alcohol. All that is necessary is t@hat the dye base should be converted-to the colored salt befdre addi@Ig th-. stilfinate ion. The sulfinic acids may be obtained by decompositio,-Li of a sulflir-dioxide containin.-diazonium salt solution (Gatfermann reaction), by reduction of the sulfonyl chloride with zinc duct or sodium sulfite, or by the alum@,num chloride catalyzed addition of sulfur d;oxide to an olefinic or aromatic compound. The yield of colorless sulfinate is usua a ve n ety percent and is often qi-iantitative. The melting points of these colorless dye salts depends on the rate of heating and cannot be used to characterize

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TITLE: Fluid based analysis of multiple analytes by a sensor array

Detail Description Paragraph:
[0061] FIGS. 4A-F depict a sequence of processing steps for the formation of a cavity and a planar top diaphragm Fabry-Perot sensor on the bottom surface of a silicon based supporting member. A sacrificial barrier layer 262a/b is deposited upon both sides of a silicon supporting member 260. The silicon supporting member 260 may be a double-side polished silicon wafer having a thickness ranging from about 100 .mu.m to about 500 .mu.m, preferably from about 200 .mu.m to about 400 .mu.m, and more preferably of about 300 .mu.m. The barrier layer 262a/b may be composed of silicon dioxide, silicon nitride, or silicon oxynitride. In one embodiment, the barrier layer 262a/b is composed of a stack of dielectric materials. As depicted in FIG. 4A, the barrier layer 262a/b is composed of a stack of dielectric materials which includes a silicon nitride layer 271a/b and a silicon dioxide layer 272a/b. Both layers may be deposited using a low pressure chemical vapor deposition ("LPCVD") process. Silicon nitride may be deposited using an LPCVD reactor by reaction of ammonia (NH.sub.3) and dichlorosilane (SiCl.sub.2H.sub.2) at a gas flow rate of about 3.5:1, a temperature of about 800.degree. C., and a pressure of about 220 mTorr. The silicon nitride layer 271a/b is deposited to a thickness in the range from about 100 .ANG. to about 500 .ANG., preferably from 200 .ANG. to about 400 .ANG., and more preferably of about 300 .ANG.. Silicon dioxide is may be deposited using an LPCVD reactor by reaction of silane (SiH.sub.4) and oxygen (02) at a gas flow rate of about 3:4, a temperature of about 450.degree. C., and a pressure of about 110 mTorr. The silicon dioxide layer 272a/b is deposited to a thickness in the range from about 3000 .ANG. to about 7000 .ANG., preferably from 4000 .ANG. to about 6000 .ANG., and more preferably of about 5000 .ANG.. The front face silicon dioxide layer 272a, in one embodiment, acts as the main barrier layer. The underlying silicon nitride layer 271a acts as an intermediate barrier layer to inhibit overetching of the main barrier layer during subsequent KOH wet anisotropic etching steps.

Detail Description Paragraph:
[0075] A naturally occurring or synthetic receptor may be bound to a polymeric resin in order to create the particle. The polymeric resin may be made from a variety of polymers including, but not limited to, agarous, dextrose, acrylamide, control pore glass beads, polystyrene-polyethylene glycol resin, polystyrene-divinyl benzene resin, formylpolystyrene resin, trityl-polystyrene resin, acetyl polystyrene resin, chloroacetyl polystyrene resin, arninomethyl polystyrene-divinylbenzene resin, carboxypolystyrene resin, chloromethylated polystyrene-divinylbenzene resin, hydroxymethyl polystyrene-divinylbenzene resin, 2-chlorotrityl chloride polystyrene resin, 4-benzyloxy-2'4'-dimethoxybenzhydrol resin (Rink Acid resin), triphenyl methanol polystyrene resin, diphenylmethanol resin, benzhydrol resin, succinimidyl carbonate resin, p-nitrophenyl carbonate resin, imidazole carbonate resin, polyacrylamide resin, 4-sulfamylbenzoyl-4'-met- hylbenzhydrylamine-resin (Safety-catch resin), 2-amino-2-(2'-nitrophenyl)p- ropionic acid-aminomethyl resin (ANP Resin), p-benzyloxybenzyl alcohol-divinylbenzene resin (Wang resin), p-methylbenzhydrylamine-diviny- lbenzene resin (MBHA resin), Fmoc-2,4-dimethoxy-4'-(carboxymethyloxy)-benz- hydrylamine linked to resin (Knorr resin), 4-(2',4'-Dimethoxyphenyl-Fmoc-a- minomethyl)-phenoxy resin (Rink resin), 4-hydroxymethyl-benzoyl-4'-methylb- enzhydrylamine resin (HMBA-MBHA Resin), p-nitrobenzophenone oxime resin (Kaiser oxime resin), and amino-2,4-dimethoxy-4'-(carboxymethyloxy)-benzh- ydrylamine handle linked to 2-chlorotrityl resin (Knorr-2-chlorotrityl resin). In one embodiment, the material used to form the polymeric resin is compatible with the solvent in which the analyte is dissolved. For example, polystyrene-divinyl benzene resin will swell within non-polar solvents, but does not significantly swell

within polar solvents. Thus, polystyrene-divinyl benzene resin may be used for the analysis of analytes within non-polar solvents. Alternatively, polystyrene-polyethylene glycol resin will swell with polar solvents such as water. Polystyrene-polyethylene glycol resin may be useful for the analysis of aqueous fluids.